

B/

interconnecting the setting tool to a fastener feeder device that releases selected fasteners from the package into the delivery tube, the fasteners being transportable individually or in groups in the tube from the feeder device to the tool, a transfer station attached to the tool or the delivery tube for transferring a fastener from the delivery tube into the tool, the transfer station being moveable between a first position in which an exit of the transfer station is adjacent to the tool so that a delivered fastener may be inserted by the transfer station into the tool and a second position in which it is clear of the tool so as to permit the tool or a portion thereof to move towards a workpiece to insert a loaded fastener characterised in that there is provided an intermediate buffer for fasteners at or proximate to the transfer station tool so that multiple fasteners may be held at the transfer station and in that the delivery tube is releasably connectable to said intermediate buffer by an automatic docking device.

81. (Currently amended) Fastener setting apparatus according to claim 4 80, wherein the docking device comprises a first portion connected to an outlet end of the delivery tube and a second portion connected to an inlet end of the intermediate buffer, the first and second portions being moveable relative to each other to engage and provide a fastener path between the tube and the buffer, the first portion having a fastener retention gate that is closed by a biasing member when the portions are disengaged and is opened against the force of the biasing when the portions are engaged.

82. (Currently amended) Fastener setting apparatus according to claim 2 81, wherein the fastener retention gate comprises a pair of retaining fingers, the fingers at least partially blocking the fastener path when the gate is closed.

83. (Currently amended) Fastener setting apparatus according to claim ~~2 or 3~~ 81, wherein the second portion comprises an inlet gate that is closed when the portions are disengaged and is open when the portions are engaged.

84. (Currently amended) Fastener setting apparatus according to claim 4 83, wherein the inlet gate comprises a pair of laterally moveable jaws that in the closed position at least partially block the fastener path and in the open position are moved laterally clear of the fastener path by abutment with the fastener retention gate.

B 85. (Currently amended) Fastener setting apparatus according to ~~any preceding~~ claim 80 wherein the transfer station is moveable relative to the setter tool by means of an actuator.

86. (Currently amended) Fastener setting apparatus according to claim 6 85, wherein the actuator operates to pivot the transfer station relative to the setting tool and to hold it against the tool.

87. (Currently amended) Fastener setting apparatus according to claim 7 86, wherein the transfer station also moves in a linear path relative to the setting tool.

88. (Currently amended) Fastener setting apparatus according to ~~any preceding~~ claim 80, wherein the transfer station has a cammed surface for abutment with a cam follower portion

of the setting tool and, in use, movement of the transfer station relative to the setting tool is governed by interaction of the cammed surface with the cam follower.

89. (Currently amended) Fastener setting apparatus according to claim 9 88, wherein the transfer station is mounted on a frame that is pivotally connected to the setting tool, the frame being extensible so as to move the transfer station in a direction substantially parallel to the direction of extension of a nose of the setting tool.

90. (Currently amended) Fastener setting apparatus according to claim ~~10~~ 89, wherein said frame also supports a portion of said delivery tube.

91. (Currently amended) Fastener setting apparatus according to ~~any preceding~~ claim 80, wherein the transfer station operates to load a fastener through side port in a nose of the setting tool.

92. (Currently amended) Fastener setting apparatus according to claim ~~12~~ 91, wherein the transfer station further comprises an automatic pusher assembly that is actuatable to push a fastener from the station into the nose.

93. (Currently amended) Fastener setting apparatus according to claim ~~13~~ 92, wherein the pusher assembly comprises at least one pusher member for pushing a leading fastener in the transfer station towards an outlet of the station and a gate disposed at the outlet

and which is biased closed so as to close at least partially the outlet and to retain the leading fastener at the outlet until the fastener is pushed therethrough by the pusher member.

94. (Currently amended) Fastener setting apparatus according to claim ~~14~~ 93, wherein the transfer station further comprises a fastener transport channel in which fasteners are transported to the outlet, the pusher member being moveable between a retracted position in which it is clear of the channel and an extended position in which it projects into the channel and engages the leading fastener and pushes it through the gate and the outlet, the pusher member being disposed such that when moving between the retracted and extended positions its path does not intersect with subsequent fasteners disposed behind the leading fastener.

95. (Currently amended) Fastener setting apparatus according to claim ~~14~~ 93, wherein the transfer station further comprises a fastener transport channel in which fasteners are transported to the outlet, the pusher member being moveable between a retracted position in which it is clear of the channel and an extended position in which it projects into the channel and engages the leading fastener and pushes it through the gate and the outlet, wherein the channel has a tortuous passage ending in a final section adjacent the outlet sufficient to retain only a single fastener, the path of the pusher member between the retracted and extended positions intersecting the final section such that when extended the pusher member moves only the leading rivet occupying the final section through the gate.

96. (Currently amended) Fastener setting apparatus according to ~~any one of claims 1 to 11~~ claim 80, wherein the transfer station operates to load a fastener into engagement with an end of a nose or punch of the setting tool.

97. (Currently amended) Fastener setting apparatus according to claim ~~17~~ 96, wherein the transfer station comprises a channel for transporting rivets to an outlet for transfer to the nose or punch of the setting tool and sliding cover member that is slidable between an at rest position in which the channel is substantially covered and a retracted position in which a leading portion of the channel adjacent the outlet is exposed so as to provide access to a leading fastener in the channel for said nose or punch.

B/ 98. (Currently amended) Fastener setting apparatus according to claim ~~18~~ 97, wherein the cover member is biased by a biasing member to the at-rest position and is moved against said biasing force by the nose or punch, such that when in the retracted position the nose or punch is aligned with the outlet so as to receive said leading fastener.

99. (Currently amended) Fastener setting apparatus according to claim ~~19~~ 98, wherein the nose or punch engages into a leading edge of the cover member to effect movement of the cover against the biasing force of the biasing member.

100. (Currently amended) Fastener setting apparatus according to claim ~~20~~ 99, wherein the travel of the cover member is limited by means of an adjustable stop.

101. (Currently amended) Fastener setting apparatus according to claim ~~20~~ 99, wherein the cover member has a ramped surface that interacts with a complementary ramped surface on an adjacent wedge member such that movement of the cover member towards the retracted position causes movement of the wedge member in a different plane, the travel of the wedge member being limited by said adjustable stop.

102. (Currently amended) Fastener setting apparatus according to ~~any one of claims 18 to 22~~ claim 97, wherein the cover member has a separator member that is moved into a position in which it projects into said channel so as to separate said leading portion of the channel from the remainder.

103. (Currently amended) Fastener setting apparatus according to claim ~~23~~ 102, wherein the separator member rides in slot defined in the cover member.

104. (Currently amended) Fastener setting apparatus according to ~~any preceding claim 80~~, the fastener package comprising a plurality of sealed channels containing fasteners, the channels being interconnected by a flexible web.

105. (Currently amended) Fastener setting apparatus according to claim ~~25~~ 104, the fastener feeder device comprising means for opening at least one channel of said fastener package so as to release the fasteners into said delivery tube.

106. (Currently amended) Fastener setting apparatus according to claim ~~26~~ 105, wherein the feeder device further comprises a blade for severing said at least one channel.

107. (Currently amended) Fastener setting apparatus according to claim ~~27~~ 106, wherein the fastener package comprises a tube in said channel, the tube having an integral closure member for retaining fasteners in said tube, the closure member being openable by engagement with a release member of the fastener feeder device.

108. (Currently amended) Fastener setting apparatus according to ~~any preceding~~ claim 80, the fastener package comprising a plurality of closed tubes containing fasteners, the tubes being housed in a support container, the fastener feeder device comprising a conveyor on which the container is disposed and a release mechanism that passes through the conveyor to open at least one of said tubes to release said fasteners into a delivery tube.

109. (Currently amended) Fastener setting apparatus according to claim ~~29~~ 108, wherein the tube has a closure member that is openable by engagement with a tube release mechanism.

110. (Currently amended) Fastener setting apparatus according to claim ~~30~~ 109, wherein the release mechanism is moveable laterally of the conveyor.

111. (Currently amended) Fastener setting apparatus according to claim ~~1~~ 80, wherein said feeder device comprises a support on which are mounted a plurality of containers each

containing fasteners in vertical array, and a release mechanism that is moveable relative to an underside of the support, the release mechanism comprising a carriage captively fitted to the support and a chamber for receiving at least one fastener from a container, an actuator for directing the fastener out of the carriage into a delivery tube and release means for releasing a fastener from the container, characterised in that the release mechanism further comprises a guide element that engages a complementary guide element on the support so that its movement under the support is along a predetermined path.

112. (Currently amended) Fastener setting apparatus according to claim 1 80, wherein said feeder device comprises a hopper having at least one aperture into which a sealed container of fasteners is releasably secured, a gate which is moveable relative to the hopper between positions which open and close the aperture and a reservoir into which released fasteners are dispensed, wherein the container has a frangible seal that is broken when the feeder device is satisfied that the contents are correct so as to release the fasteners, the gate moving to the open position to pass the fasteners to the reservoir.

113. (Currently amended) Fastener setting apparatus according to ~~any preceding~~ claim 80, wherein there is provided a fastener escapement device having a moveable surface that projects through an aperture provided in the delivery tube so as, in use, to trap at least one fastener in the delivery tube, the escapement device further comprising a drive for selectively indexing said surface so as, in use, to move the at least one fastener in the delivery tube towards a release position.



114. (Currently amended) Fastener setting apparatus according to claim 34 113, wherein the escapement device further comprises a sensor at the release position for sensing the presence of a fastener, the sensor being associated with a counter for counting the number of fasteners that pass the release position.

115. (Currently amended) Fastener setting apparatus according to claim 34 ~~or 35~~ 113, wherein the surface is defined on a continuous endless loop conveyor.

B 116. (Currently amended) Fastener setting apparatus according to ~~any preceding~~ claim 80, wherein the delivery tube has a bend, the bend dividing the tube into incoming and outgoing portions, a transverse aperture in said incoming portion for connection to a source of pressurized fluid and a fluid recirculation chamber substantially opposite said aperture for redirecting incoming fluid into said outgoing portion such that, in use, said fluid passing through the aperture is incident on fasteners in the incoming position so as to retain them there and is redirected in said recirculation chamber so as to be incident on the lead rivet at the bend and to propel it into the outgoing portion.

117. (Currently amended) Fastener setting apparatus according to claim 37 116, wherein there is provided a further transverse aperture upstream in said incoming portion.

118. (Currently amended) Fastener setting apparatus according to ~~any preceding~~ claim 80, wherein there is provided at least two delivery tubes that merge at an intersection into a

single outlet tube, a pivotal gate disposed at the intersection selectively closing one of the delivery tubes.

119. (Currently amended) Fastener setting apparatus according to claim ~~39~~ 118, wherein the gate is movable between a first position in which it closes a first incoming delivery tube so as to leave a clear path between a second incoming delivery tube and an outlet tube.

120. (Currently amended) Fastener setting apparatus according to ~~any preceding~~ claim 80, wherein the transfer station is connected to at least two delivery tubes and a rotary gate is disposed at an intersection of the tubes, the gate being moveable between a first position in which it blocks a first of the delivery tubes and leaves clear a path between a second of delivery tubes and an outlet of the transfer station and a second position in which it blocks the second of the delivery tubes and leaves clear a path between a first of the delivery tubes and the outlet.

121. (Currently amended) Fastener setting apparatus according to claim ~~41~~ 120, wherein the gate has a channel therein to allow communication between a selected one of the delivery tubes and the outlet.

122. (Currently amended) Fastener delivery apparatus according to ~~any one of claims 1 to 42~~ claim 80, wherein at least one delivery tube comprises at least first and second inlet branches connected to a single outlet branch, and a gate being disposed between the inlet and outlet and being operable to close communication between one of the inlet branches and the outlet branch.

123. (Currently amended) Fastener delivery apparatus according to claim 43 122, wherein the gate is pivotally mounted in the tube and is operable to close communication between the first inlet and the outlet branch by being struck by a fastener travelling along a second inlet branch.

124. (Currently amended) Fastener delivery apparatus according to ~~any one of claims 1 to 42~~ claim 80, wherein the transfer station has a rotation device for rotating the fastener through substantially a right angle so that it is correctly oriented for entry into a fastener delivery passage of the setting tool, the rotation device comprising a carriage that is moveable along a transfer path toward the fastener delivery passage and is designed to receive a fastener from the delivery tube, a cam surface that causes the carriage to rotate through a right angle as it moves align the transfer path, and a plunger for moving the rotated fastener out of the carriage into the fastener delivery passage.

125. (Currently amended) Fastener delivery apparatus according to claim 45 124, wherein the carriage further comprises a fastener support pivotally mounted on a pivot member that is moveable in a slot defined along the transfer path.

126. (Currently amended) Fastener delivery apparatus according to claim 46 125, wherein the cam surface is defined on an interference block disposed in the transfer path of the carriage such that the pivot member rotate when it slides over the surface.

127. (Currently amended) Fastener delivery apparatus according to claim 47 126, wherein the carriage further comprises a rotary element having a helical cam surface that moves over a fixed pin on the transfer station so that axial movement of the carriage also causes it to rotate.

128. (Previously added) Fastener setting apparatus for a fastener setting tool comprising a transfer station associated with the tool and connected to at least two fastener delivery tubes, a rotary gate disposed at an intersection of the tubes, the gate being moveable between a first position in which it blocks a first of the delivery tubes and leaves clear a path between a second of delivery tubes and an outlet of the transfer station and a second position in which it blocks the second of the delivery tubes and leaves clear a path between a first of the delivery tubes and the outlet.

129. (Currently amended) Fastener setting apparatus according to claim 49 128, wherein the gate has a channel therein to allow communication between a selected one of the delivery tubes and the outlet.

---

Please add new claims 130 -140 to the application.

---

130. (New) A fastener feeder assembly for fastener delivery apparatus comprising a support on which are mounted a plurality of containers each containing fasteners in vertical array, and a release mechanism that is moveable relative to an underside of the support between said plurality of containers, the release mechanism comprising a carriage captively fitted to the support, release means for releasing a fastener from a selected container into a delivery tube and

a guide element that engages a complementary guide element on the support the guide element extending between containers so that movement of the release mechanisms under the support is along a predetermined path.

131. (New) A fastener feeder assembly according to claim 130, wherein the fasteners are released from the container into the carriage under gravity.

132. (New) A fastener feeder assembly according to claims 130, wherein the release means is a pusher arm that pushes the released fastener to a position adjacent an exit aperture.


133. (New) A fastener feeder assembly according to claims 131, wherein the release means is a pusher arm that pushes the released fastener to a position adjacent an exit aperture.

134. (New) A fastener feeder assembly according to claims 130, wherein the support is inclined to the horizontal so that the carriage is moveable in at least one direction under gravity.

135. (New) A fastener feeder assembly according to claims 131, wherein the support is inclined to the horizontal so that the carriage is moveable in at least one direction under gravity.

136. (New) A fastener feeder assembly according to claim 130, wherein the fasteners are housed in a plurality of closed tubes, each tube having a closure member that is openable by the release means to release the fasteners.

137. (New) A fastener assembly according to claim 136, wherein the release means is a projecting member that deflects the closure member of the tube.

 138. (New) A fastener feeder assembly according to claim 130, wherein the delivery tube is connected to the carriage such that it is in communication with an outlet aperture of the carriage.

139. (New) A fastener feeder assembly according to claim 138, wherein there is provided means for generating a blast of air to propel a fastener from the carriage and into said delivery tube.

---